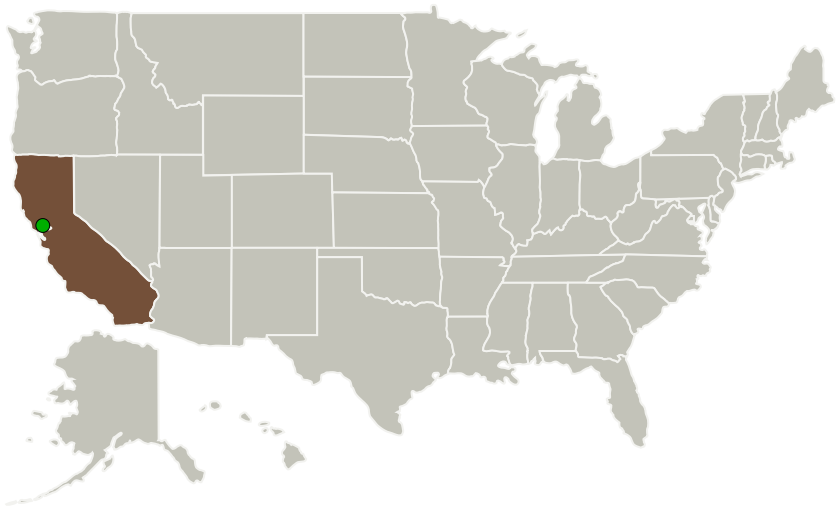
Lunar Navigator - A Miniature, Fully Autonomous, Lunar Navigation, Surveyor, and Range Finder System, Phase II

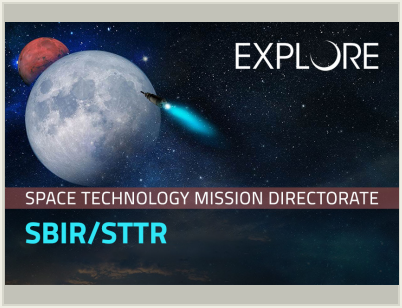
Completed Technology Project (2010 - 2011)

Project Introduction

Microcosm will use existing hardware and software from related programs to create a prototype Lunar Navigation Sensor (LNS) early in Phase II, such that most of the effort can be spent in extensive field-testing, making corrections as needed, and critical evaluation of the LNS performance on Earth and projected performance on the Moon. By using NGS survey markers, with centimeter-leve position accuracy, as test sites, we expect to create a truth model for both absolute and relative position measurements that is essentially error free (relative to the LNS accuracy), thus allowing very accurate characterization of both random and systematic errors for both absolute and relative position measurements. This unambiguous characterization of the total error will allow validation (or correction) of the navigation error models and assessment of system performance with a high level of confidence. Additionally, the LNS prototype hardware is sufficiently small (roughly shoebox size with a laptop PC for data collection) and easy to set up (put on a tripod over the NGS marker), that it can easily be taken to multiple test locations. Finally, a detailed technology roadmap will be created showing how the TRL 6 LNS can be raised to TRL 9, ready for flight.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Microcosm, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	Hawthorne, California
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations
California

Project Transitions

February 2010: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139196)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Microcosm, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

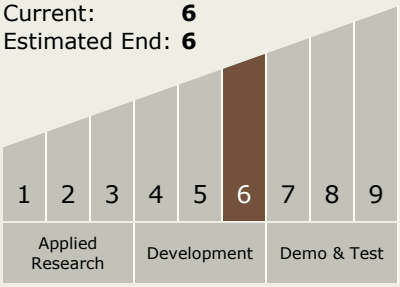
Carlos Torrez

Principal Investigator:

James R Wertz

Technology Maturity (TRL)

Start: **6**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.2 Mobility
    - TX04.2.4 Surface Mobility

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System